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HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

EXAMINER	
KIM, DAVID S	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/827,807	EFFENBERGER ET AL.
	Examiner	**Art Unit**
	David S. Kim	2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 8-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 8-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Applicant's compliance with the objection to claim 3 in the previous Office Action (mailed on 30 December 2004) is noted and appreciated. Applicant's amendment to claim 3 overcomes the previous objection. Accordingly, the previous objection is withdrawn.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. **Claims 1, 5, and 18-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ali et al. (U.S. Patent No. 4,726,010, hereinafter "Ali") in view of <u>Adams et al. (European Patent Application EP 1 063 803 A1, hereinafter "Adams")</u>.

Regarding claim 1, Ali discloses:

A communications network comprising:

a passive optical network (PON) (waveguides and star coupler 2 in Fig. 2);

plural user terminals (subscribers 3a to 3n) coupled to the PON, each user terminal having an optical transmitter (transmitters 32a to 32n) for transmitting an upstream signal in an optical channel

dedicated to the user terminal and an optical receiver (receivers 31a to 31n) for receiving a shared downstream signal in a shared optical channel;

a central terminal (center 1) coupled to the PON and having an optical transmitter (transmitter 11) for transmitting the shared downstream signal and plural optical receivers (col. 3, l. 64-68) each receiving one of the dedicated upstream signals; the central terminal optical transmitter transmitting the shared downstream signals in a shared optical channel at wavelength λ_o (λ_o in Figs.),

wherein the plural optical receivers include a first group of optical receivers (col. 3, l. 64-68, group of optical receivers that corresponds to a first grouping of subscribers 3a to 3n) configured to receive upstream signals from WDM sources associated with a first group (any first grouping of subscribers 3a to 3n) of user terminals each having an optical transmitter that includes a WDM source, and the plural optical receivers include a second group of optical receivers (col. 3, l. 64-68, group of optical receivers that corresponds to a second grouping of subscribers 3a to 3n) configured to receive upstream signals from WDM sources associated with a second group (any second grouping of subscribers 3a to 3n) of user terminals each having an optical transmitter that includes a WDM source.

Ali does not expressly disclose:

wherein the plural optical receivers include a first group of optical receivers configured to receive upstream signals from *coarse WDM lasers* associated with a first group of user terminals each having an optical transmitter that includes a *coarse WDM laser*, and the plural optical receivers include a second group of optical receivers configured to receive upstream signals from *dense WDM lasers* associated with and a second group of user terminals each having an optical transmitter that includes a *dense WDM laser*.

However, user terminals having optical transmitters that include coarse WDM lasers or dense WDM lasers are well known in the art. Adams teaches the use of both types of lasers in optical transmitters in the same network (Adams, paragraphs [0003-0004], [0021]). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to arrange each user terminal of one group of user terminals of Adams to have an optical transmitter that includes a *coarse WDM laser* and to arrange each user terminal of another group of user terminals of Adams to have an optical

transmitter that includes a *dense WDM laser*. One of ordinary skill in the art would have been motivated to do this so that "a 'pay as you grow' approach can be used, wherein capacity may be upgraded (added)" (Adams, paragraphs [0008], [0021]). That is, Adams teaches the outlay of coarse WDM (CWDM) components due its lower costs compared to dense WDM (DWDM) components. Then, Adams teaches the addition of DWDM components to upgrade capacity, a "pay as you grow" approach. The result is a network that employs both CWDM lasers and DWDM lasers. One advantage of this approach is the relative low cost of CWDM components.

Regarding claim 5, Ali in view of Adams discloses:

The communications network of Claim 1 wherein the there are N user terminals (N>1) (subscribers 3a to 3n) and wherein the central terminal optical transmitter transmits the shared downstream signal in a shared optical channel at wavelength λ_0 (λ_0 in Figs.) and the user terminal optical transmitters transmit the upstream signals in dedicated optical channels at dedicated wavelengths λ_1 to λ_N (λ_1 to λ_N in Figs.), respectively.

Regarding claims 18-19, claims 18 and 19 are method claims that correspond to network claims 1 and 5, respectively. Therefore, the recited means in network claims 1 and 5 read on the corresponding steps in method claims 18-19.

5. **Claims 6, 8-14, and 20-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ali in view of Adams as applied to the claims above, and further in view of Campbell ("Coarse WDM makes waves in metro/access markets").

Regarding claims 6 and 8-14, these claims introduce various assignments of wavelengths. Ali in view of Adams does not expressly disclose these particular assignments. However, Campbell does disclose a range of usable wavelengths that includes all of the introduced wavelengths below (Campbell, Fig. 2). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to apply the wavelength teachings of Campbell to the network of Ali in view of Adams. One of ordinary skill in the art would have been motivated to do this since Campbell teaches that these wavelength teachings apply to CWDM and DWDM networks (Campbell, Fig. 2), such as the network of Ali in view of

Adams. Examiner notes that these various assignments of wavelengths are obvious variations of implementing the network of Ali in view of Adams and Campbell.

(claim 6) The communications network of Claim 1 wherein the central wavelength λ_0 is at the 1310 nm band (conventional band for inexpensive Fabry-Perot lasers) the wavelengths λ_1 to λ_N are between 1500 and 1600 nm (Campbell, band for EDFA transmissions, Fig. 2).

(claim 8) The communications network of Claim 1 wherein the first group comprises up to four user terminals having course WDM lasers that operate respectively at dedicated wavelengths of 1511, 1531, 1571, and 1591 nm (Campbell, conventional wavelengths for CWDM, 2nd to last paragraph).

(claim 9) The communications network of Claim 1 wherein the second group comprises up to eight user terminals having dense WDM lasers that operate at dedicated ITU channels (DWDM systems conventionally operate according to the ITU DWDM standard channel plan).

(claim 10) The communications network of Claim 9 wherein the ITU channels include ITU channels #27, #29, #31, #33, #35, #37, #39, and #41 (simple selection of ITU channels).

(claim 11) The communications network of Claim 1 wherein wavelength λ_0 is at the 1310 band (conventional band for inexpensive Fabry-Perot lasers).

(claim 12) The communications network of Claim 5 wherein wavelength λ_0 and the wavelengths λ_1 to λ_N are selected from channels between 1500 and 1600 nm (Campbell, band for EDFA transmissions, Fig. 2).

(claim 13) The communications network of Claim 12 wherein wavelength λ_0 and the wavelengths λ_1 to λ_N are selected from channels between 1540 and 1565 nm (Campbell, band for EDFA transmissions, Fig. 2).

(claim 14) The communications network of Claim 13 wherein wavelength λ_0 is at ITU channel #30 and for N less than 16, the wavelengths λ_1 to λ_N are selected from ITU channels #31 to #44, respectively (Campbell, band for EDFA transmissions that coincides with these standard ITU channels, Fig. 2).

Regarding claims 20-21, claims 20 and 21 are method claims that correspond to network claims 6 and 12, respectively. Therefore, the recited means in network claims 6 and 12 read on the corresponding steps in method claims 20-21.

6. **Claims 2-4 and 15-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ali in view of Adams as applied to claim 1 above, and further in view of Ramaswami et al. (*Optical Networks: A Practical Perspective*, hereinafter "Ramaswami").

Regarding claim 2, Ali in view of Adams discloses:

The communications network of Claim 1 wherein the central terminal includes a *WDM device* (Ali, col. 3, l. 64-68) for separating the dedicated upstream channels for reception at the plural central terminal optical receivers.

Ali in view of Adams does not expressly disclose:

said WDM device being a *WDM filter array.*

However, a WDM filter array is just one conventional type of WDM device. Ramaswami shows a WDM filter array (TFF in Fig. 3.17) along with other types of WDM devices (section 3.3, p. 90-119). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to employ a WDM filter array type of WDM device, as shown in Ramaswami. One of ordinary skill in the art would have been motivated to do this since such filter arrays have many features that make them attractive for system applications, such as a flat top on passbands, sharp skirts, stability with regard to temperature variations, low loss, and insensitivity to signal polarization (Ramaswami, p. 108, 1st full paragraph).

Regarding claim 3, Ali in view of Adams and Ramaswami discloses:

The communication network of Claim 1 wherein the WDM filter array comprises a thin-film filter device (Ramaswami, p. 106, thin-film filters).

Regarding claim 4, Ali in view of Adams discloses:

The communications network of Claim 1 wherein the user terminals each include a *device* (Ali, directional coupler 33a to 33n) for isolating the shared downstream channel for reception at the user terminal optical receiver.

Ali in view of Adams does not expressly disclose:

said device being a WDM filter.

Rather, Ali in view of Adams teaches said device being a directional coupler. However, it is a well-known property of directional couplers to split the power of an input signal between its output ports (Ramaswami, p. 84). Notice that such splitting of power of the input signals to the user terminals of Ali result in power and signal loss due to portions of the signals being directed to the optical transmitters (that do not process these signals) and away from the optical receivers. As an alternative, notice another conventional type of WDM device, a WDM filter (Ramaswami, TFF in Fig. 3.17), which provides the same functionality as the directional coupler of Ali. Additionally, notice that Adams teaches user terminals that include the same type of WDM filter (Adams, TFF in paragraph [0016]) for isolating a desire channel for reception at the user terminal optical receiver. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to employ a WDM filter type of WDM device, as shown in Ramaswami and Adams. One of ordinary skill in the art would have been motivated to do this since such filters have many features that make them attractive for system applications, such as a flat top on passbands, sharp skirts, stability with regard to temperature variations, low loss, and insensitivity to signal polarization (Ramaswami, p. 108, 1st full paragraph).

Regarding claims 15-17, these claims introduce various time-division multiplex communication standards and conventional components that correspond to the standards. Ali in view of Adams does not expressly disclose all of these standards and components but does disclose some of these standards and components and the general implementation of time-division multiplex communications (Ali, col. 2, l. 30-59). Examiner notes that these various standards and components are obvious variations of implementing the network of Ali in view of Adams. Ramaswami teaches each of these standards and benefits of employing each:

(claim 15) The communications network of Claim 1 wherein the central terminal includes an SDH/SONET multiplexer, the user terminals each include an SDH/SONET add-drop multiplexer () and the shared downstream signal is a static time division multiplex signal (Ramaswami, p. 265-266, synchronized transmissions for easy component design, extensive management information for monitoring performance of traffic, standard interfaces that enable interoperability between equipment from different vendors, protection schemes to provide high-availability services; Adams, paragraph

[0006], use of SONET implies the use of standard SONET components, such as a SONET multiplexer and a SONET add-drop multiplexer).

(claim 16) The communications network of Claim 1 wherein the central terminal includes an ATM switch and framer, the user terminals each include an ATM framer and the shared downstream signal is a dynamic ATM time division multiplex signal (Ramaswami, p. 276-277, quality-of-service guarantees, easy provision of such guarantees, packet sizes for integrating voice and data communications; Adams, paragraphs [0001], [0006], [0011]).

(claim 17) The communications network of Claim 1 wherein the central terminal and the user terminals each include an Ethernet switch and the shared downstream signal is an Ethernet time division multiplex signal (Ramaswami, p. 277-278, enablement of the extremely well-known and widely-used IP protocol).

Response to Arguments

7. Applicant's arguments with respect to amended independent claims 1 and 18 have been considered but are moot in view of the new ground(s) of rejection. The present set of rejections rely on newly applied references to Adams to address the new limitations introduced to independent claims 1 and 18 by Applicant's amendment filed on 01 March 2005.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chraplyvy et al. is cited to show a network that employs CWDM and DWDM teachings.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DSK

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600